

REMARKS

Applicants wish to thank the Examiner for his careful consideration of the subject patent application. The Examiner has rejected claims 1-8, 10, and 15-18 under 35 U.S.C. §102(e) as anticipated by Khair et al. (US Patent 6,615,580). The Examiner further rejected Claims 1, 2, 4, 10-12, 15-17, and 19-21 under 35 U.S.C. §102(e) as anticipated by Boretto et al. (US Patent Application 2003/0167757).

Prior to responding to the Examiner's comments, Applicants would like to briefly review the present invention. As stated in the Background of the Invention, the prior art teaches controlling particulate filter regeneration based on differential pressure across the filter. The differential pressure across the filter may be determined either using two absolute pressure sensors (one upstream and another downstream of the filter), or by using a differential pressure sensor with two pressure tabs. Applicants have recognized a disadvantage with such an approach. Namely, using two sensors or one sensor with two pressure tabs results in high material and installation costs. Further, the underbody placement of the pressure sensors exposes them to external weather conditions that may degrade their performance. Accordingly, Applicant's solution is to estimate a pressure drop across the particulate filter based on a signal from a single pressure sensor placed upstream of the particulate filter. In other words, Applicant's solution eliminated the need for a differential pressure sensor or a second absolute pressure sensor placed downstream of the filter. In this way, installation and material costs are reduced. Further, the sensor may be placed in the engine compartment and thus shielded from the adverse weather conditions.

35 U.S.C. 102(e) REJECTION OF CLAIMS 1-8, 10, AND 15-18 in view of Khair:

The Khair reference cited by the states (see col. 8, lines 4-11):

"Temperature and pressure sensors 430 and 433 are placed at the DPF 410 b to determine the need for DPF regeneration"

Further, in col. 8, lines 54-58, Khair teaches:

"The control logic also monitors and controls the regeneration of the DPF 411. For the DPF 411, filter pressure drop (dp) and inlet exhaust temperature are monitored with pressure and temperature sensors 430 and 433".

In other words, Khair's sensor 430 is a differential pressure sensor, as it measures a pressure drop across the DPF.

Applicant's, on the other hand, claim a system and a method wherein the pressure drop across the filter is calculated based on a signal from a pressure sensor coupled only upstream of the particulate filter. Accordingly, Claim 1 claims:

1. A diagnostic system, comprising:

an emission control system comprising at least a particulate filter, said emission control system coupled downstream of an internal combustion engine;
 an exhaust sensor coupled only upstream of said emission control system, providing a signal indicative of an exhaust gas pressure upstream of said emission control system; and
 a computer storage medium having a computer program encoded therein, comprising:
 code for estimating a pressure drop across the particulate filter based on at least said sensor signal.

In other words, Applicant's claimed solution eliminates the need for the differential pressure sensor of Khair. Further, there is absolutely no teaching or even mention anywhere in Khair of estimating the amount of particulate accumulated in the filter using only the exhaust pressure sensor located upstream of the filter. Therefore, Applicants respectfully submit that the Khair reference cited by the Examiner does not anticipate Applicant's Claim 1, and allowance is respectfully requested. Further, Claims 2-14 depend from allowable Claim 1, and should therefore be allowed.

In the interests of brevity, Applicant's comments with respect to Claim 1 apply to Claims 15-24, and allowance of those claims is respectfully requested.

Further, new Claim 25 claims:

An emission control system coupled downstream of an internal combustion engine, comprising:
 a first device;
 a second device coupled upstream of said first device;
 a sensor coupled upstream of said second device; and
 a computer storage medium having a computer program encoded therein, comprising:
 code for regenerating said first device based on a signal provided by said sensor coupled upstream of said second device.

Applicants respectfully submit that new Claim 25 is patentable over the Khair reference. Specifically, Applicants teach regenerating the first device based on a signal from a sensor coupled upstream of the first device, wherein the first device is coupled upstream of the second device. Khair, also teaches a first device (410a – oxidation catalyst), and a second device (410b – DPF). However, Khair's pressure sensor 433 is placed on the DPF, and not upstream of the first device, as is claimed by Applicants. Further, there is absolutely no teaching anywhere in Khair of regenerating the filter based on a signal from a pressure sensor located upstream of the first device. Therefore, Applicants respectfully submit that new Claim 25 is patentable over Khair and allowance is respectfully requested. Further, new claims 26-32 depend from allowable Claim 25 and should be allowed.

35 U.S.C. 102(e) REJECTION OF CLAIMS 1, 2, 4, 10-12, 15-17, and 19-21 in view of Boretto:

The Boretto reference cited by the Examiner states in [0052]:

" More specifically, electronic control system 11 comprises an airflow measuring device (debimeter) 12 located along air intake conduit 5 and generating a signal indicating airflow along air intake conduit 5; a differential pressure sensor 13 having a first and a second input connected close to the inlet of Front- cat 10 and the outlet of particulate filter 9 respectively, and an output supplying a pressure drop signal which, by means of the method described in the present invention, can be related to the amount of particulate accumulated in particulate filter 9".

In other words, Boretto teaches a system wherein the amount of particulate accumulated in the filter is correlated to the differential pressure measurement across the filter. As discussed above with respect to the Khair reference, there is absolutely no teaching or even mention anywhere in Boretto of using only an upstream exhaust pressure sensor to estimate the pressure drop across the filter.

Therefore, Applicants respectfully submit that the cited reference does not anticipate any of the pending claims of the present application, and reversal of rejection based on Boretto is requested.

35 U.S.C. 103(a) REJECTION OF CLAIMS 9 (Khair) AND 24 (Boretto in view of Maaseidvaag)

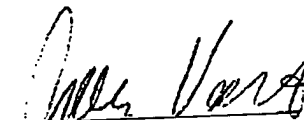
Applicants respectfully submit that both Khair and Boretto are missing a critical claimed limitation of the present invention (a single exhaust pressure sensor located upstream of the filter rather than a differential pressure sensor). Further, the Examiner does not even allege that the secondary references teach or even mention the missing limitation. Therefore, Applicants respectfully submit that Claims 9 and 24 are patentable, and allowance is respectfully requested.

CONCLUSION

No other art is cited in the Office Action. Based on the foregoing comments, the above-identified application is believed to be in condition for allowance, and such allowance is courteously solicited. If any further amendment is necessary to advance prosecution and place this case in allowable condition, the Examiner is courteously requested to contact the undersigned by fax or telephone at the number listed below.

Please charge any cost incurred in the filing of this Amendment, along with any other costs, to Deposit Account 06-1510. If there are insufficient funds in this account, please charge the fees to Deposit Account No.06-1505.

Respectfully submitted,



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